



# The Great Plains Ratsnake, *Pantherophis emoryi* Baird & Girard, 1853, (Squamata: Colubridae), a new state record from Aguascalientes, México

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**Abstract:** We report an adult male specimen of the snake *Pantherophis emoryi* from xerophytic scrub habitat in the Municipality of Real de Asientos, Aguascalientes, México. This specimen represents the first state record of *P. emoryi* from Aguascalientes and extends the known distribution of the species 107 km in a straight line west-northwest from the nearest previous record. Our specimen was found in habitat that is under heavy agricultural pressure, and recently, threatened by mining. This may indicate that other Chihuahuan Desert taxa may be found in this area.

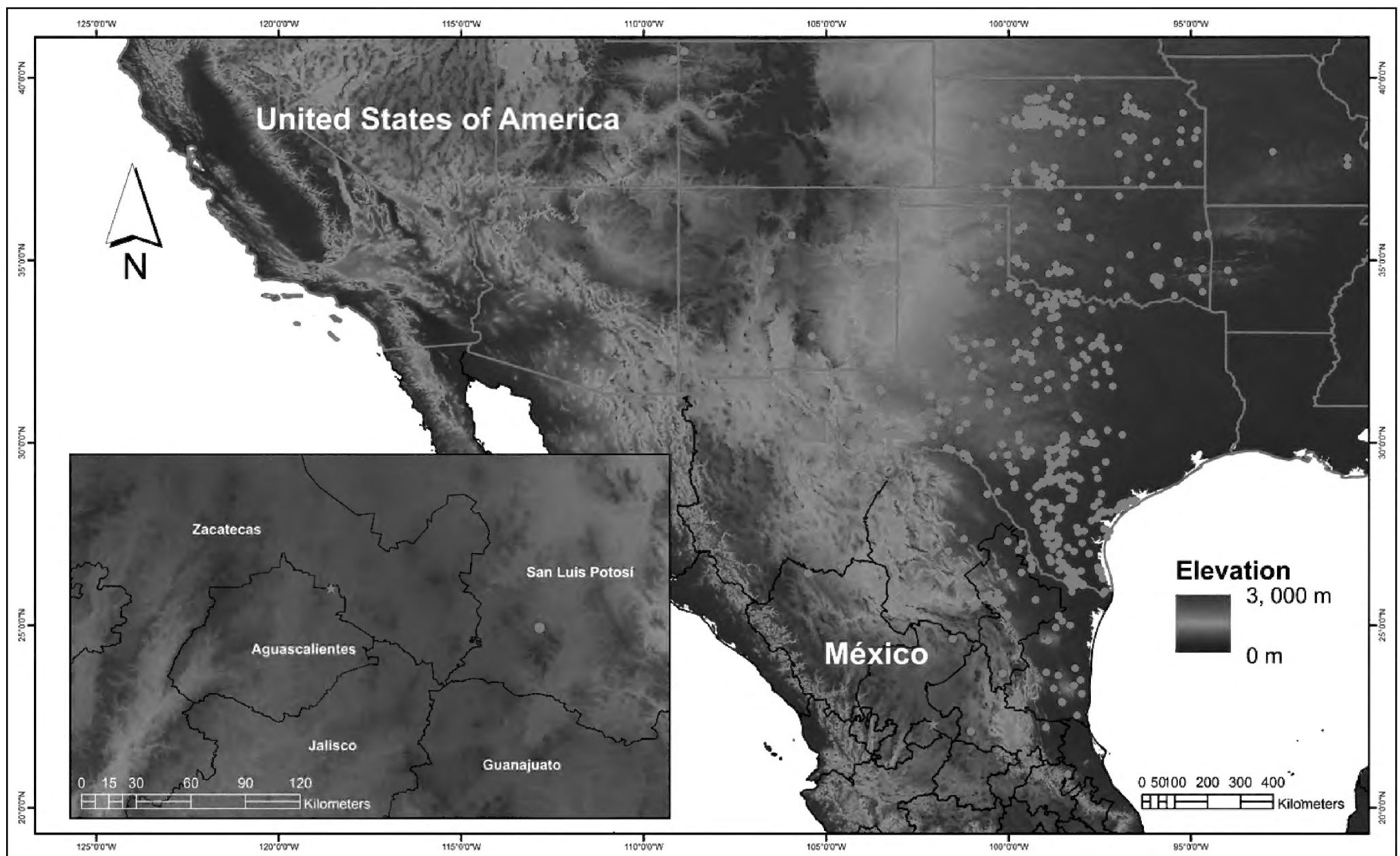
**Key words:** Real de Asientos; new record; xerophytic scrub; Chihuahuan Desert

The Great Plains Ratsnake (*Pantherophis emoryi* Baird & Girard, 1853) has a wide distribution; the range extends from southwestern Illinois, Missouri, southern South Dakota, and southeastern Colorado in the U.S.A., southward to San Luis Potosi and Veracruz in México (Hammerson 2007). In Mexico the range includes the states of Chihuahua, Coahuila, Durango, Hidalgo, Nuevo León, Querétaro, San Luis Potosí, Tamaulipas and Veracruz (Hammerson 2007; Lemos-Espinal and Smith 2009; Ramírez-Bautista et al. 2014; Lemos-Espinal and Smith 2015). It has been reported from Jalisco, but this is erroneous, based on misidentified juvenile specimens of *Senticolis triaspis* Cope, 1866 (Cruz-Sáenz et al. 2008; Flores-Cobarrubias et al. 2012). The species is listed by the IUCN as Least Concern (LC) and not listed by Norma Oficial Mexicana (NOM-059-SEMARNAT-2010) (Hammerson 2007; Diario Oficial de la Federación 2010).

At the present time, 67 species of reptiles occur in Aguascalientes, with many recently documented (Vázquez-Díaz and Quintero-Díaz 2005; Quintero-Díaz et al. 2008; Carbajal-Márquez et al. 2011; Arenas-Monroy et al. 2014; Quintero Díaz et al. 2014; Carbajal-Márquez et al. 2015). We present data on an additional species, *Pantherophis emoryi*, which represents a new state record.

During a field trip on 5 May 2015, with the purpose of updating the inventory of herpetofauna from Aguascalientes, ACA found a dead-on-road specimen of *Pantherophis emoryi* on a paved road surrounded by xerophytic scrub in the Municipality of Real de Asientos, Aguascalientes, (22.284455° N, 102.067940° W [WGS84]; 2,064 m above sea level). The specimen was collected under permit SEMARNAT SGPA/DGVS/05143/14, identified by J. Jesús Sigala-Rodríguez, and deposited in the Vertebrate Collection at Universidad Autónoma de Aguascalientes (voucher UAA-CZUAA-REP-0508). This specimen is an adult male (snout vent length = 840 mm, total length = 967 mm). Vegetation in the xerophytic scrub was Twisted Acacia (*Acacia schaffneri*), Catclaw Mimosa (*Mimosa monacistra*), Leatherstem (*Jatropha dioica*), Silver Prairie-clover (*Dalea bicolor*), and Prickly Pear (*Opuntia* spp.) (Rosales-Carrillo 2008).

*Pantherophis emoryi* is a medium sized snake reaching 1,530 mm in total length (Lemos-Espinal and Smith 2009). The head scales are: preoculars 1–1, postoculars 2–2, anterior temporals 2–2 or more, supralabials 8–8, and infralabials usually 11–13. Midbody scale rows usually 27 but often 29, ventrals 201–236, subcaudals 60–83. Dorsal scales usually have 2 apical pits. The dorsal coloration is light gray, olive or brown, with



**Figure 1.** Collecting localities for *Pantherophis emoryi* across its geographic range in México and United States of America (Appendix, Table A1). The star represents the new record of *Pantherophis emoryi* for Aguascalientes at Real de Asientos. The black lines represent state boundaries in Mexico, and gray lines state boundaries in U.S.A.

28–45 (37) squarish or rectangular brown dorsal blotches on the body, 11–23 (16) on the tail, and a lateral series of smaller blotches. The underside of the head and much of the ventral surface is white. Small black spots are scattered posteriorly on the ventral scales, and continue on the subcaudals. The only other similar colubrid snake occurring in Aguascalientes are juveniles of *Senticolis triaspis* (Green Rat Snake), which differs from *P. emoryi* in having 31–35 dorsal scales at midbody, 80 or more dorsal blotches on the body, dark lines on the head fragmented, except for the interorbital bar, and restricted to the southwest portion of Aguascalientes; *P. emoryi* has 27–29 dorsal scales at midbody, 28–45 dorsal blotches, large arrow-shaped dark marks on top and sides of the head, and is restricted to northeastern Aguascalientes. No subspecies are recognized for *Pantherophis emoryi* (Price 1991; Burbrink 2002; Lemos-Espinal and Smith 2009).

This specimen represents the first record of the species for the state of Aguascalientes and extends the known geographic range 107 km in a straight line west-northwest from 4.8 km west of San Luis Potosí city, San Luis Potosí (Lemos-Espinal and Dixon 2013), and 263 km south-southwest from Mazapil, Zacatecas (J. Jesús Sigala-Rodríguez, pers. comm.) (Figure 1). Our specimen was found in xerophytic scrub, a habitat that in Real de Asientos is rapidly being transformed into

crop and livestock production, and also threatened by mining. This and other recent herpetofaunal findings in the arid zone of Aguascalientes suggest that additional species typical of the Chihuahuan Desert may be found in this area.

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APPENDIX

**Table A1.** Records of *Pantherophis emoryi* obtained from the present study, personal communications, published literature and museum specimens consulted in GBIF. AMNH: American Museum of Natural History; BYU: Brigham Young University; CAS: California Academy of Science; CM: Carnegie Museum of Natural History; FHSM: Fort Hays State University; FMNH: Field Museum of Natural History; KU: University of Kansas Natural History Museum; LACM: Natural History Museum of Los Angeles County; MCZ: Museum of Comparative Zoology; MSB: Museum of Southwestern Biology; NCSM: North Carolina Museum of Natural Sciences; OMNH: Osaka Museum of Natural History; OSUM: Ohio State University; SDNHM: San Diego Natural History Museum; TCWC: Texas Cooperative Wildlife Collection; UAA: Universidad Autónoma de Aguascalientes; UANL: Universidad Autónoma de Nuevo León; UBCBBM: University of British Columbia; UCM: University of Colorado Museum; UMMZ: University of Michigan Museum of Zoology; USNM: National Museum of Natural History, Smithsonian Institution; UTEP: University of Texas at El Paso; YPM: Yale University, Peabody Museum of Natural History.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
MX	Aguascalientes	UAA	CZUAA-REP-0508	22.2845	-102.0679	This study
MX	Chihuahua	CM	59911	29.05	-105.59	GBIF
MX	Chihuahua	CM	59913	29.05	-105.59	GBIF
MX	Chihuahua	CM	59912	29.05	-105.59	GBIF
MX	Chihuahua	iNaturalist	1609908	29.4562	-104.1986	GBIF
MX	Chihuahua	iNaturalist	1636826	29.2661	-103.7848	GBIF
MX	Coahuila	CM	59914	26.6103	-101.3602	GBIF
MX	Coahuila	CM	42762	27.0103	-102.0802	GBIF
MX	Coahuila	CM	59916	25.7503	-102.9702	GBIF
MX	Coahuila	CM	48184	27.0403	-101.6502	GBIF
MX	Coahuila	CM	59915	27.3703	-101.2202	GBIF
MX	Coahuila	iNaturalist	719828	25.6153	-100.846	GBIF
MX	Coahuila	iNaturalist	1930054	28.5928	-100.5875	GBIF
MX	Coahuila	SDNHM	60475	26.04	-101.34	GBIF
MX	Coahuila	SDNHM	60474	26.34	-101.36	GBIF
MX	Coahuila	UTEP	H-3797	25.6503	-102.0002	GBIF
MX	Coahuila	UTEP	H-6336	25.7703	-101.1102	GBIF
MX	Durango	CAS	135101	26.4303	-105.4903	GBIF
MX	Durango	CAS	87410	26.4351	-105.4902	GBIF
MX	Hidalgo	—	—	20.9032	-099.2257	Ramírez-Bautista et al. 2014
MX	Hidalgo	—	—	20.9193	-098.3725	Ramírez-Bautista et al. 2014
MX	Nuevo León	CM	66486	25.6703	-100.2802	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
MX	Nuevo León	CM	53965	25.8003	-100.5902	GBIF
MX	Nuevo León	FMNH	46143	25.556	-100.908	GBIF
MX	Nuevo León	iNaturalist	1639062	29.5029	-104.2447	GBIF
MX	Nuevo León	iNaturalist	1351728	25.6208	-100.3237	GBIF
MX	Nuevo León	OMNH	33466	25.8903	-100.2903	GBIF
MX	Nuevo León	TCWC	38603	26.4546	-100.1608	GBIF
MX	Nuevo León	TCWC	38979	26.3876	-100.1339	GBIF
MX	Nuevo León	TCWC	53047	27.0562	-099.7287	GBIF
MX	Nuevo León	UANL	1243	25.748	-100.297	GBIF
MX	Nuevo León	UANL	2907	25.748	-100.297	GBIF
MX	Nuevo León	UANL	3971	23.681	-100.164	GBIF
MX	Nuevo León	UANL	3970	23.681	-100.164	GBIF
MX	Nuevo León	UANL	2565	25.703	-099.262	GBIF
MX	Nuevo León	UANL	2076	25.691	-100.168	GBIF
MX	Nuevo León	UANL	1810	26.451	-099.652	GBIF
MX	Nuevo León	UANL	2032	25.809	-100.593	GBIF
MX	Nuevo León	UANL	473	25.698	-100.338	GBIF
MX	Nuevo León	UCM	47378	25.7603	-100.5402	GBIF
MX	Nuevo León	UMMZ	101925	25.285	-100.019	GBIF
MX	Nuevo León	—	6340 / B099	27.299	-100.02	GBIF
MX	Querétaro	UTEP	H-09116	21.4433	-099.6135	GBIF
MX	San Luis Potosí	CAS	115862	22.2005	-098.9801	GBIF
MX	San Luis Potosí	CM	66485	22.2005	-098.9801	GBIF
MX	San Luis Potosí	iNaturalist	1237609	22.2976	-099.6314	GBIF
MX	San Luis Potosí	UCM	46009	23.5434	-110.0937	GBIF
MX	San Luis Potosí	—	—	22.09	-101.04	Lemos-Espinal and Dixon 2013
MX	Tamaulipas	AMNH	110403	23.709	-098.968	GBIF
MX	Tamaulipas	FMNH	105154	23.27	-098.77	GBIF
MX	Tamaulipas	iNaturalist	2483524	26.0507	-098.2725	GBIF
MX	Tamaulipas	iNaturalist	2368882	26.1839	-098.3798	GBIF
MX	Tamaulipas	iNaturalist	1052879	26.1846	-098.3795	GBIF
MX	Tamaulipas	SDNHM	57001	23.05	-099.71	GBIF
MX	Tamaulipas	TCWC	67003	24.582	-098.911	GBIF
MX	Tamaulipas	UANL	4172	22.889	-098.525	GBIF
MX	Tamaulipas	UANL	4911	23.822	-098.177	GBIF
MX	Tamaulipas	UANL	4731	26.844	-099.428	GBIF
MX	Tamaulipas	UANL	4625	25.263	-098.631	GBIF
MX	Tamaulipas	UANL	4684	26.529	-099.369	GBIF
MX	Tamaulipas	UANL	4168	22.901	-098.548	GBIF
MX	Tamaulipas	UANL	2414	27.25	-099.63	GBIF
MX	Tamaulipas	UANL	4734	26.668	-099.351	GBIF
MX	Tamaulipas	UANL	4995	24.94	-098.708	GBIF
MX	Tamaulipas	UANL	4945	23.127	-097.996	GBIF
MX	Tamaulipas	UANL	4980	25.003	-098.314	GBIF
MX	Tamaulipas	UANL	4175	22.528	-098.129	GBIF
MX	Tamaulipas	UANL	4854 / 4754 / H104	22.951	-099.86	GBIF
MX	Tamaulipas	UANL	4951	23.499	-098.032	GBIF
MX	Tamaulipas	UANL	4870	23.622	-098.639	GBIF
MX	Tamaulipas	UANL	4632	25.116	-098.53	GBIF
MX	Tamaulipas	UCM	50118	25.917	-098.2668	GBIF
MX	Tamaulipas	UTEP	H-5100	23.3504	-098.2101	GBIF
MX	Zacatecas	—	—	24.6305	-101.5292	Sigala-Rodríguez J. - pers. comm
US	Arkansas	OMNH	8361	34.4087	-093.8288	GBIF
US	Arkansas	OMNH	42676	34.7272	-093.9908	GBIF
US	Arkansas	OMNH	2586	34.7272	-093.9908	GBIF
US	Colorado	UCM	AC-178	40.7232	-108.8878	GBIF
US	Colorado	UCM	18108	38.9911	-108.1386	GBIF
US	Kansas	FHSM	187	39.1303	-099.3541	GBIF
US	Kansas	FHSM	1477	39.4179	-099.4311	GBIF
US	Kansas	FHSM	3277	39.0301	-098.9264	GBIF
US	Kansas	FHSM	3348	38.9818	-098.7003	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Kansas	FHSM	3375	38.999	-098.925	GBIF
US	Kansas	FHSM	3376	38.9818	-098.7003	GBIF
US	Kansas	FHSM	3549	38.8738	-098.7579	GBIF
US	Kansas	FHSM	3694	38.6929	-099.5665	GBIF
US	Kansas	FHSM	4302	38.9862	-098.9635	GBIF
US	Kansas	FHSM	4304	38.9862	-098.9635	GBIF
US	Kansas	FHSM	4464	38.8205	-098.2254	GBIF
US	Kansas	FHSM	6739	38.9727	-098.8731	GBIF
US	Kansas	MCZ	R-29034	39.2767	-096.7884	GBIF
US	Kansas	FHSM	12770	37.3414	-096.0981	GBIF
US	Kansas	FHSM	13346	38.7519	-099.338	GBIF
US	Kansas	FHSM	13954	38.7854	-098.5841	GBIF
US	Kansas	UTEP	H-5115	38.7858	-097.9838	GBIF
US	Kansas	FHSM	15946	39.0413	-095.2283	GBIF
US	Kansas	FHSM	2168	38.9615	-098.8542	GBIF
US	Kansas	FHSM	4301	38.9422	-098.9086	GBIF
US	Kansas	FHSM	4514	37.5458	-098.7397	GBIF
US	Kansas	FHSM	6000	38.839	-097.5822	GBIF
US	Kansas	FHSM	11567	39.4535	-098.9439	GBIF
US	Kansas	FHSM	11594	38.7128	-099.4323	GBIF
US	Kansas	FHSM	12092	37.4072	-099.7766	GBIF
US	Kansas	FHSM	12883	37.6102	-099.3029	GBIF
US	Kansas	FHSM	1395	38.8579	-099.4258	GBIF
US	Kansas	FHSM	1398	38.8579	-099.4258	GBIF
US	Kansas	FHSM	1431	37.1965	-096.7592	GBIF
US	Kansas	FHSM	3572	38.9428	-099.2153	GBIF
US	Kansas	FHSM	4299	38.8727	-098.7373	GBIF
US	Kansas	FHSM	6109	38.7459	-099.5498	GBIF
US	Kansas	FHSM	9070	39.4155	-099.2766	GBIF
US	Kansas	FHSM	11600	38.7128	-099.4323	GBIF
US	Kansas	FHSM	12903	38.9011	-098.5715	GBIF
US	Kansas	FHSM	3380	38.9498	-098.8617	GBIF
US	Kansas	FHSM	3396	38.9027	-098.7165	GBIF
US	Kansas	FHSM	3467	39.0301	-098.9264	GBIF
US	Kansas	FHSM	11789	38.9984	-098.8727	GBIF
US	Kansas	CM	S5434	38.56	-094.8301	GBIF
US	Kansas	CM	S8671	38.57	-095.2701	GBIF
US	Kansas	UTEP	Ho-16	38.7743	-099.7475	GBIF
US	Kansas	FHSM	457	38.8528	-099.2965	GBIF
US	Kansas	FHSM	5863	37.4561	-099.2491	GBIF
US	Kansas	FHSM	6110	38.7459	-099.5498	GBIF
US	Kansas	FHSM	7908	38.6972	-099.156	GBIF
US	Kansas	FHSM	11294	37.0008	-098.8779	GBIF
US	Kansas	FHSM	11596	38.7128	-099.4323	GBIF
US	Kansas	KU	221199	37.0323	-096.3176	GBIF
US	Kansas	FHSM	2270	38.8423	-098.6194	GBIF
US	Kansas	FHSM	2378	38.8706	-099.3622	GBIF
US	Kansas	FHSM	3418	38.7247	-099.7631	GBIF
US	Kansas	FHSM	3426	38.912	-098.9842	GBIF
US	Kansas	FHSM	3598	38.7324	-099.3938	GBIF
US	Kansas	FHSM	7883	39.0472	-099.0309	GBIF
US	Kansas	FHSM	12383	38.0655	-099.8834	GBIF
US	Kansas	FHSM	1393	38.9143	-099.332	GBIF
US	Kansas	FHSM	1399	38.9294	-098.8638	GBIF
US	Kansas	FHSM	1428	38.8579	-099.4258	GBIF
US	Kansas	FHSM	1479	39.4179	-099.4311	GBIF
US	Kansas	FHSM	2495	38.9615	-098.8542	GBIF
US	Kansas	FHSM	2518	38.9641	-098.8514	GBIF
US	Kansas	FHSM	3369	38.8738	-098.7579	GBIF
US	Kansas	FHSM	3512	39.4648	-099.2779	GBIF
US	Kansas	FHSM	3521	39.1169	-099.2751	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Kansas	FHSM	7699	37.9214	-096.9813	GBIF
US	Kansas	FHSM	9537	37.2823	-098.7799	GBIF
US	Kansas	FHSM	11302	37.1148	-098.5683	GBIF
US	Kansas	FHSM	16345	39.9885	-098.1268	GBIF
US	Kansas	FHSM	6113	38.9365	-098.6974	GBIF
US	Kansas	FHSM	7104	38.9165	-098.5876	GBIF
US	Kansas	FHSM	8896	39.4902	-096.743	GBIF
US	Kansas	MCZ	R-29035	39.2767	-096.7884	GBIF
US	Kansas	FHSM	15010	38.9145	-099.3123	GBIF
US	Kansas	FHSM	12082	39.1025	-099.251	GBIF
US	Kansas	FHSM	12263	37.448	-099.2599	GBIF
US	Kansas	UTEP	H-5119	38.7936	-099.8163	GBIF
US	Kansas	FHSM	1397	38.8579	-099.4258	GBIF
US	Kansas	FHSM	4473	38.7104	-099.2997	GBIF
US	Kansas	FHSM	6001	39.0616	-099.4158	GBIF
US	Kansas	FHSM	8633	37.3983	-099.1322	GBIF
US	Kansas	FHSM	8435	37.5211	-102.0135	GBIF
US	Kansas	FHSM	9584	37.281	-099.0408	GBIF
US	Kansas	FHSM	11009	38.3717	-096.5936	GBIF
US	Kansas	FHSM	11599	38.7128	-099.4323	GBIF
US	Kansas	FHSM	12083	38.9486	-099.4189	GBIF
US	Kansas	FHSM	13539	37.0067	-100.6177	GBIF
US	Kansas	FHSM	750	37.0749	-098.9635	GBIF
US	Kansas	FHSM	1482	38.8335	-099.4088	GBIF
US	Kansas	FHSM	4303	38.9862	-098.9635	GBIF
US	Kansas	FHSM	6106	38.7459	-099.5498	GBIF
US	Kansas	FHSM	11067	38.3935	-096.8015	GBIF
US	Kansas	FHSM	13955	38.7854	-098.5841	GBIF
US	Kansas	CM	59844	39.19	-096.5801	GBIF
US	Kansas	FHSM	2282	38.8108	-099.7616	GBIF
US	Kansas	FHSM	2283	38.8108	-099.7616	GBIF
US	Kansas	FHSM	3417	38.7247	-099.7631	GBIF
US	Kansas	FHSM	9654	39.3764	-099.2782	GBIF
US	Kansas	FHSM	12937	37.417	-098.9846	GBIF
US	Kansas	FHSM	455	39.0436	-099.3142	GBIF
US	Kansas	FHSM	2279	38.7395	-099.3545	GBIF
US	Kansas	FHSM	3548	38.8738	-098.7579	GBIF
US	Kansas	FHSM	5366	38.9451	-098.6702	GBIF
US	Kansas	FHSM	7720	39.0441	-098.9852	GBIF
US	Kansas	FHSM	8964	39.2994	-098.5274	GBIF
US	Kansas	FHSM	11429	39.0745	-099.0933	GBIF
US	Kansas	FHSM	13953	38.7854	-098.5841	GBIF
US	Kansas	UTEP	H-5118	38.478	-098.6366	GBIF
US	Kansas	FHSM	13596	38.2586	-095.9564	GBIF
US	Kansas	FHSM	1396	38.8579	-099.4258	GBIF
US	Kansas	FHSM	1478	39.4179	-099.4311	GBIF
US	Kansas	FHSM	2280	38.7395	-099.3545	GBIF
US	Kansas	FHSM	3295	39.4142	-099.4202	GBIF
US	Kansas	FHSM	3693	38.6929	-099.5665	GBIF
US	Kansas	FHSM	4372	39.1025	-099.1829	GBIF
US	Kansas	FHSM	12081	39.1025	-099.251	GBIF
US	Kansas	FHSM	12300	38.7992	-099.0218	GBIF
US	Kansas	UTEP	H-5116	38.8097	-097.5746	GBIF
US	Kansas	UTEP	H-5117	38.9832	-099.0766	GBIF
US	Kansas	FHSM	456	38.8764	-099.3716	GBIF
US	Kansas	FHSM	1302	38.7175	-099.2259	GBIF
US	Kansas	FHSM	1429	38.8192	-099.3905	GBIF
US	Kansas	FHSM	1480	38.8341	-099.4285	GBIF
US	Kansas	FHSM	2284	38.8108	-099.7616	GBIF
US	Kansas	FHSM	3379	38.9498	-098.8617	GBIF
US	Kansas	FHSM	3573	38.9428	-099.2153	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Kansas	FHSM	4374	39.023	-099.5306	GBIF
US	Kansas	FHSM	6740	38.9727	-098.8731	GBIF
US	Kansas	FHSM	7084	39.043	-098.9908	GBIF
US	Kansas	FHSM	11773	38.9178	-099.0022	GBIF
US	Kansas	FHSM	14019	38.8339	-100.1078	GBIF
US	Kansas	FHSM	12931	38.3497	-094.8997	GBIF
US	Kansas	FHSM	3160	38.9303	-098.7088	GBIF
US	Kansas	FHSM	5537	38.8232	-097.466	GBIF
US	Kansas	FHSM	7498	39.1256	-099.5162	GBIF
US	Kansas	FHSM	8047	39.1836	-099.0283	GBIF
US	Kansas	FHSM	13697	38.9512	-096.2228	GBIF
US	Kansas	FHSM	13952	38.7854	-098.5841	GBIF
US	Kansas	USNM	2259.600083	38.2272	-095.2965	GBIF
US	Kansas	FHSM	13541	37.203	-098.9217	GBIF
US	Kansas	FHSM	3461	38.9303	-098.7088	GBIF
US	Kansas	FHSM	4370	38.9058	-099.4453	GBIF
US	Kansas	FHSM	4371	39.1321	-099.2206	GBIF
US	Kansas	FHSM	5299	38.6858	-100.9195	GBIF
US	Kansas	FHSM	5864	37.4561	-099.2491	GBIF
US	Kansas	FHSM	9748	39.3978	-099.4723	GBIF
US	Kansas	iNaturalist	1400496	39.0884	-096.8139	GBIF
US	Kansas	FHSM	12930	38.916	-098.476	GBIF
US	Kansas	FHSM	3522	39.1169	-099.2751	GBIF
US	Kansas	FHSM	3683	38.9371	-098.9813	GBIF
US	Kansas	FHSM	4300	38.8727	-098.7373	GBIF
US	Kansas	FHSM	4472	38.7104	-099.2997	GBIF
US	Kansas	FHSM	9576	37.2822	-098.7858	GBIF
US	Kansas	FHSM	10805	37.0521	-095.3595	GBIF
US	Kansas	FHSM	11776	39.0279	-099.0017	GBIF
US	Kansas	FHSM	14214	39.6982	-098.8443	GBIF
US	Kansas	OMNH	37940	38.9368	-098.6965	GBIF
US	Kansas	FHSM	186	39.1303	-099.3541	GBIF
US	Kansas	FHSM	1481	38.9294	-098.8638	GBIF
US	Kansas	FHSM	2574	38.727	-099.7575	GBIF
US	Kansas	FHSM	3377	38.9818	-098.7003	GBIF
US	Kansas	FHSM	3533	38.9428	-099.2153	GBIF
US	Kansas	FHSM	6111	38.724	-099.2839	GBIF
US	Kansas	FHSM	6768	37.1209	-099.1706	GBIF
US	Kansas	FHSM	8086	39.5025	-098.3293	GBIF
US	Kansas	FHSM	11829	39.019	-098.8539	GBIF
US	Kansas	OMNH	34313	38.2864	-096.6731	GBIF
US	Kansas	FHSM	12915	37.6452	-094.8265	GBIF
US	Kansas	MCZ	R-5419	39.19	-096.5859	GBIF
US	Kansas	FHSM	1403	38.9294	-098.8638	GBIF
US	Kansas	FHSM	2516	38.9641	-098.8514	GBIF
US	Kansas	FHSM	4296	37.0743	-099.7476	GBIF
US	Kansas	FHSM	5394	37.2042	-099.8363	GBIF
US	Kansas	FHSM	8039	38.7994	-099.0196	GBIF
US	Kansas	FHSM	11828	39.0308	-098.8538	GBIF
US	Kansas	FHSM	11597	38.7128	-099.4323	GBIF
US	Kansas	FHSM	11595	38.7128	-099.4323	GBIF
US	Kansas	FHSM	1430	38.8339	-099.2613	GBIF
US	Kansas	FHSM	1483	38.8571	-099.4614	GBIF
US	Kansas	FHSM	2573	38.727	-099.7575	GBIF
US	Kansas	FHSM	3298	39.4043	-099.1568	GBIF
US	Kansas	FHSM	3370	38.8738	-098.7579	GBIF
US	Kansas	FHSM	6107	38.7459	-099.5498	GBIF
US	Kansas	FHSM	6112	38.9963	-098.7249	GBIF
US	Kansas	FHSM	9677	39.3764	-099.2782	GBIF
US	Kansas	FHSM	12877	37.4226	-099.1528	GBIF
US	Kansas	FHSM	464	38.9498	-098.8617	GBIF

Continued



Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Kansas	FHSM	1394	38.9143	-099.332	GBIF
US	Kansas	FHSM	2517	38.9641	-098.8514	GBIF
US	Kansas	FHSM	3425	38.8713	-098.7355	GBIF
US	Kansas	FHSM	4369	38.8491	-099.4281	GBIF
US	Kansas	FHSM	6108	38.7459	-099.5498	GBIF
US	Kansas	FHSM	8040	38.7994	-099.0196	GBIF
US	Kansas	FHSM	11602	38.7128	-099.4323	GBIF
US	Kansas	FHSM	11598	38.7128	-099.4323	GBIF
US	Kansas	FHSM	12382	38.0655	-099.8834	GBIF
US	Kansas	iNaturalist	459674	39.1045	-096.5955	GBIF
US	Kansas	KU	337079	39.1178	-096.5818	GBIF
US	Kansas	FHSM	2269	39.0797	-099.2453	GBIF
US	Kansas	FHSM	3297	39.4043	-099.1568	GBIF
US	Kansas	FHSM	4373	38.7279	-099.3222	GBIF
US	Kansas	FHSM	5725	38.9597	-098.858	GBIF
US	Kansas	FHSM	8434	37.5211	-102.0135	GBIF
US	Kansas	FHSM	9749	39.0637	-096.5489	GBIF
US	Kansas	FHSM	11068	38.3935	-096.8015	GBIF
US	Kansas	FHSM	11399	37.5236	-102.012	GBIF
US	Kansas	OMNH	37947	39.2233	-098.397	GBIF
US	Kansas	FHSM	756	38.8758	-099.7975	GBIF
US	Kansas	FHSM	3471	38.9355	-098.798	GBIF
US	Kansas	FHSM	4375	38.7175	-099.2259	GBIF
US	Kansas	FHSM	4465	38.6994	-098.4107	GBIF
US	Kansas	FHSM	5536	38.8232	-097.466	GBIF
US	Kansas	FHSM	8062	37.6917	-095.6767	GBIF
US	Kansas	FHSM	11066	38.3935	-096.8015	GBIF
US	Kansas	FHSM	11601	38.7128	-099.4323	GBIF
US	Kansas	OSUM	607	38.5	-098	GBIF
US	Kansas	FHSM	3296	39.4142	-099.4202	GBIF
US	Kansas	FHSM	3381	38.9498	-098.8617	GBIF
US	Kansas	FHSM	4298	38.8727	-098.7373	GBIF
US	Kansas	FHSM	6261	37.6439	-094.8006	GBIF
US	Kansas	FHSM	7508	38.7942	-098.7445	GBIF
US	Kansas	FHSM	9662	39.0089	-096.4015	GBIF
US	Kansas	FHSM	13029	37.6397	-094.806	GBIF
US	Misuri	iNaturalist	67922	37.802	-090.7099	GBIF
US	Misuri	iNaturalist	388151	38.1446	-090.1682	GBIF
US	Misuri	iNaturalist	127953	37.5975	-090.7133	GBIF
US	Misuri	iNaturalist	388857	37.9778	-092.7647	GBIF
US	New Mexico	MSB	72005	35.02	-104.68	GBIF
US	New Mexico	MSB	72545	34.73	-106.54	GBIF
US	New Mexico	CAS	71794	35.6869	-105.9372	GBIF
US	New Mexico	MSB	71883	36.54	-103.13	GBIF
US	New Mexico	iNaturalist	83816	34.2445	-103.3178	GBIF
US	New Mexico	iNaturalist	345563	33.3186	-104.33	GBIF
US	New Mexico	TCWC	95057	32.7968	-104.1828	GBIF
US	New Mexico	MSB	72006	32.92	-105.39	GBIF
US	New Mexico	FHSM	12598	32.2334	-104.3067	GBIF
US	New Mexico	KU	289015	36.357	-103.0717	GBIF
US	New Mexico	MSB	65757	34.4	-104.2	GBIF
US	New Mexico	LACM	2321	35.0683	-104.2819	GBIF
US	New Mexico	UTEP	H-19520	32.6149	-107.8817	GBIF
US	Oklahoma	OMNH	10289	35.1468	-096.67	GBIF
US	Oklahoma	OMNH	12901	34.7553	-098.4885	GBIF
US	Oklahoma	OMNH	30880	34.0141	-096.7615	GBIF
US	Oklahoma	OMNH	22890	36.3541	-098.5722	GBIF
US	Oklahoma	OMNH	25291	36.7379	-098.0921	GBIF
US	Oklahoma	OMNH	42946	34.524	-094.9689	GBIF
US	Oklahoma	OMNH	42942	34.4599	-095.9603	GBIF
US	Oklahoma	OMNH	43819	34.9922	-095.3552	GBIF

Continued



Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Oklahoma	OMNH	5080	34.4203	-094.8242	GBIF
US	Oklahoma	OMNH	33993	36.9041	-102.935	GBIF
US	Oklahoma	OMNH	35825	34.777	-094.6911	GBIF
US	Oklahoma	OMNH	42941	34.4555	-095.9715	GBIF
US	Oklahoma	OMNH	39264	35.7289	-094.533	GBIF
US	Oklahoma	OMNH	41876	34.3298	-095.9053	GBIF
US	Oklahoma	OMNH	8213	34.712	-098.6794	GBIF
US	Oklahoma	OMNH	5081	34.524	-094.9689	GBIF
US	Oklahoma	OMNH	6142	35.6651	-094.8319	GBIF
US	Oklahoma	OMNH	8860	34.7358	-097.2207	GBIF
US	Oklahoma	OMNH	13187	34.8851	-098.7035	GBIF
US	Oklahoma	OMNH	13742	36.8518	-100.0555	GBIF
US	Oklahoma	OMNH	25976	36.7672	-096.977	GBIF
US	Oklahoma	OMNH	40100	35.6751	-094.832	GBIF
US	Oklahoma	OMNH	42943	34.5494	-096.0114	GBIF
US	Oklahoma	OMNH	42940	34.458	-096.0232	GBIF
US	Oklahoma	OMNH	41875	34.3167	-095.884	GBIF
US	Oklahoma	OMNH	43943	34.0315	-095.4536	GBIF
US	Oklahoma	OMNH	6140	35.638	-094.8289	GBIF
US	Oklahoma	OMNH	6523	34.3298	-095.9053	GBIF
US	Oklahoma	OMNH	5079	34.5538	-095.9649	GBIF
US	Oklahoma	OMNH	29266	35.909	-098.4111	GBIF
US	Oklahoma	OMNH	35640	34.6869	-098.5556	GBIF
US	Oklahoma	SDNHM	56014	36.0557	-098.3925	GBIF
US	Oklahoma	OMNH	12900	34.7553	-098.4885	GBIF
US	Oklahoma	OMNH	11160	34.9129	-095.3406	GBIF
US	Oklahoma	OMNH	26868	35.3999	-095.9364	GBIF
US	Oklahoma	OMNH	27691	34.1368	-094.6874	GBIF
US	Oklahoma	OMNH	6141	35.7002	-094.8294	GBIF
US	Oklahoma	OMNH	5073	34.4555	-095.9715	GBIF
US	Oklahoma	OMNH	5077	34.4599	-095.9603	GBIF
US	Oklahoma	OMNH	7066	35.9253	-099.5848	GBIF
US	Oklahoma	OMNH	42939	34.5067	-095.8311	GBIF
US	Oklahoma	OMNH	5076	34.5494	-096.0114	GBIF
US	Oklahoma	OMNH	26889	34.7168	-098.7075	GBIF
US	Oklahoma	OMNH	42736	35.9253	-099.5848	GBIF
US	Oklahoma	OMNH	29278	34.9295	-099.7339	GBIF
US	Oklahoma	OMNH	41951	35.6281	-097.7619	GBIF
US	Oklahoma	OMNH	43820	34.5361	-094.8296	GBIF
US	Oklahoma	OMNH	5078	34.5572	-095.9595	GBIF
US	Oklahoma	OMNH	6555	34.3167	-095.884	GBIF
US	Oklahoma	OMNH	9223	34.0315	-095.4536	GBIF
US	Oklahoma	OMNH	9224	35.0155	-099.8457	GBIF
US	Oklahoma	OMNH	35636	34.6773	-098.6497	GBIF
US	Oklahoma	OMNH	35826	34.78	-094.693	GBIF
US	Oklahoma	OMNH	42945	34.4203	-094.8242	GBIF
US	Oklahoma	OMNH	35637	34.693	-098.3239	GBIF
US	Oklahoma	OMNH	4448	34.638	-098.8976	GBIF
US	Oklahoma	OMNH	8137	34.712	-098.6794	GBIF
US	Oklahoma	OMNH	25825	34.845	-099.5322	GBIF
US	Oklahoma	OMNH	26438	35.826	-099.73	GBIF
US	Oklahoma	OMNH	40264	34.3655	-097.2843	GBIF
US	Oklahoma	OMNH	41877	35.0504	-099.7651	GBIF
US	Oklahoma	OMNH	8360	34.9922	-095.3552	GBIF
US	Oklahoma	OMNH	43944	35.0155	-099.8457	GBIF
US	Oklahoma	UTEP	H-8454	35.9122	-098.5697	GBIF
US	Oklahoma	OMNH	5074	34.5067	-095.8311	GBIF
US	Oklahoma	OMNH	5075	34.4614	-095.9884	GBIF
US	Oklahoma	OMNH	5072	34.458	-096.0232	GBIF
US	Texas	iNaturalist	830798	30.6998	-104.1164	GBIF
US	Texas	iNaturalist	1482802	29.2635	-097.6186	GBIF

Continued

**Table A1.** *Continued.*

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	iNaturalist	1568967	29.2837	-103.7282	GBIF
US	Texas	TCWC	14988	34.9696	-101.54	GBIF
US	Texas	TCWC	33626	26.2505	-098.3896	GBIF
US	Texas	TCWC	61541	35.7055	-101.6776	GBIF
US	Texas	TCWC	67488	32.4319	-099.5164	GBIF
US	Texas	TCWC	79757	32.741	-100.4688	GBIF
US	Texas	TCWC	82468	28.2021	-098.8364	GBIF
US	Texas	UTEP	H-16230	27.4589	-099.0214	GBIF
US	Texas	iNaturalist	786691	30.1954	-102.9543	GBIF
US	Texas	iNaturalist	796050	28.2157	-098.622	GBIF
US	Texas	iNaturalist	1106787	30.7148	-103.7825	GBIF
US	Texas	TCWC	38239	26.1047	-098.2459	GBIF
US	Texas	TCWC	38776	28.9473	-099.0818	GBIF
US	Texas	TCWC	38853	33.6597	-097.7207	GBIF
US	Texas	TCWC	60487	32.2143	-099.3618	GBIF
US	Texas	TCWC	64618	28.7755	-099.8367	GBIF
US	Texas	TCWC	65077	32.755	-099.2768	GBIF
US	Texas	TCWC	77184	33.6442	-098.8175	GBIF
US	Texas	TCWC	79950	29.815	-099.5758	GBIF
US	Texas	iNaturalist	1627260	32.6268	-097.7252	GBIF
US	Texas	TCWC	38854	32.9913	-099.2491	GBIF
US	Texas	TCWC	77170	33.9085	-098.4916	GBIF
US	Texas	TCWC	77171	26.2225	-098.1948	GBIF
US	Texas	TCWC	79248	27.932	-098.6186	GBIF
US	Texas	TCWC	79254	27.1933	-098.7417	GBIF
US	Texas	FHSM	14948	30.2127	-103.0619	GBIF
US	Texas	iNaturalist	1379768	27.8641	-099.2152	GBIF
US	Texas	UTEP	H-13784	31.7614	-106.4186	GBIF
US	Texas	iNaturalist	1058270	28.2667	-099.2206	GBIF
US	Texas	iNaturalist	1580712	30.1401	-102.3878	GBIF
US	Texas	iNaturalist	1608416	28.3561	-096.8679	GBIF
US	Texas	iNaturalist	1590110	32.7809	-097.5344	GBIF
US	Texas	iNaturalist	1628219	30.8063	-103.9088	GBIF
US	Texas	iNaturalist	1621815	30.5884	-101.9283	GBIF
US	Texas	iNaturalist	1472950	27.6755	-099.0434	GBIF
US	Texas	iNaturalist	1472926	26.9526	-098.5939	GBIF
US	Texas	iNaturalist	1472916	26.601	-098.4217	GBIF
US	Texas	iNaturalist	1517578	28.2841	-096.8216	GBIF
US	Texas	iNaturalist	449713	30.0283	-097.9237	GBIF
US	Texas	iNaturalist	674036	30.2298	-097.7212	GBIF
US	Texas	iNaturalist	743998	26.4467	-097.4779	GBIF
US	Texas	iNaturalist	741701	31.4022	-100.5066	GBIF
US	Texas	iNaturalist	1949613	28.3053	-096.8053	GBIF
US	Texas	iNaturalist	278751	27.6875	-098.1308	GBIF
US	Texas	iNaturalist	1703539	30.5476	-104.2694	GBIF
US	Texas	iNaturalist	1771738	30.3823	-103.5511	GBIF
US	Texas	iNaturalist	1270908	26.3707	-098.2266	GBIF
US	Texas	SDNHM	57041	30.2341	-103.5663	GBIF
US	Texas	CAS	74427	29.4466	-098.494	GBIF
US	Texas	TCWC	93868	27.4179	-097.3034	GBIF
US	Texas	TCWC	39280	28.1781	-099.3157	GBIF
US	Texas	TCWC	64013	28.7837	-099.245	GBIF
US	Texas	TCWC	65075	32.755	-099.2768	GBIF
US	Texas	TCWC	77186	33.8095	-098.9462	GBIF
US	Texas	TCWC	77191	34.0961	-098.6946	GBIF
US	Texas	TCWC	95145	25.8674	-097.4125	GBIF
US	Texas	TCWC	93013	29.4831	-097.3411	GBIF
US	Texas	TCWC	58401	32.2936	-097.8384	GBIF
US	Texas	TCWC	72478	34.3556	-099.9634	GBIF
US	Texas	TCWC	77168	34.3172	-099.8243	GBIF
US	Texas	TCWC	77172	33.9085	-098.4916	GBIF

*Continued*

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	TCWC	77178	33.8172	-098.1953	GBIF
US	Texas	TCWC	79240	29.5317	-098.5683	GBIF
US	Texas	TCWC	82466	29.0281	-097.555	GBIF
US	Texas	UTEP	H-3562	31.9089	-106.6335	GBIF
US	Texas	UTEP	H-18592	31.1874	-105.7443	GBIF
US	Texas	iNaturalist	776912	28.9525	-098.5685	GBIF
US	Texas	TCWC	31093	28.2621	-097.6541	GBIF
US	Texas	TCWC	38980	29.0768	-098.594	GBIF
US	Texas	TCWC	52025	28.6075	-097.4596	GBIF
US	Texas	TCWC	52847	26.1218	-098.1963	GBIF
US	Texas	TCWC	71159	32.2773	-101.1079	GBIF
US	Texas	TCWC	72479	34.9572	-100.2214	GBIF
US	Texas	TCWC	77165	33.7581	-098.6953	GBIF
US	Texas	UTEP	H-09989	31.7629	-106.4244	GBIF
US	Texas	UTEP	H-17492	31.7633	-106.4228	GBIF
US	Texas	iNaturalist	760506	30.213	-103.0617	GBIF
US	Texas	iNaturalist	906160	26.4778	-098.3692	GBIF
US	Texas	iNaturalist	704585	29.6611	-100.0352	GBIF
US	Texas	iNaturalist	1107216	29.6305	-099.5222	GBIF
US	Texas	iNaturalist	1334323	29.0823	-098.9104	GBIF
US	Texas	iNaturalist	1409852	32.5905	-101.2225	GBIF
US	Texas	iNaturalist	1545748	28.3625	-098.9978	GBIF
US	Texas	iNaturalist	1622300	30.6567	-104.2565	GBIF
US	Texas	iNaturalist	1627297	30.8019	-103.8489	GBIF
US	Texas	iNaturalist	1594301	28.2382	-096.8048	GBIF
US	Texas	iNaturalist	1707276	27.2567	-097.9859	GBIF
US	Texas	iNaturalist	1644884	33.9955	-099.4002	GBIF
US	Texas	iNaturalist	1930484	28.2517	-096.7913	GBIF
US	Texas	iNaturalist	1849221	30.1911	-102.8822	GBIF
US	Texas	iNaturalist	1921964	26.7237	-098.5692	GBIF
US	Texas	iNaturalist	496939	29.0481	-098.8802	GBIF
US	Texas	iNaturalist	693280	26.7166	-098.5249	GBIF
US	Texas	iNaturalist	681319	32.8299	-101.4623	GBIF
US	Texas	iNaturalist	879037	29.7365	-098.5129	GBIF
US	Texas	YPM	YPM HERR 002789	32.6731	-097.4603	GBIF
US	Texas	YPM	YPM HERR 002722	30.9442	-103.6667	GBIF
US	Texas	CAS	74478	31.5492	-097.1464	GBIF
US	Texas	TCWC	5219	35.9149	-100.2955	GBIF
US	Texas	TCWC	38774	27.795	-098.7978	GBIF
US	Texas	TCWC	64616	28.8721	-099.8524	GBIF
US	Texas	TCWC	77174	33.9085	-098.4916	GBIF
US	Texas	TCWC	77192	33.757	-099.1499	GBIF
US	Texas	UTEP	H-18305	28.6756	-098.2143	GBIF
US	Texas	iNaturalist	1137489	27.7078	-098.8373	GBIF
US	Texas	TCWC	38236	30.7492	-098.1577	GBIF
US	Texas	UTEP	H-17974	31.8859	-104.8221	GBIF
US	Texas	UTEP	H-20785	30.9513	-103.7738	GBIF
US	Texas	TCWC	18313	26.551	-098.372	GBIF
US	Texas	TCWC	20313	34.0293	-098.9715	GBIF
US	Texas	TCWC	20407	32.9007	-097.4656	GBIF
US	Texas	TCWC	33618	26.9678	-097.7947	GBIF
US	Texas	TCWC	65274	32.0574	-098.1895	GBIF
US	Texas	TCWC	77180	33.5848	-099.2615	GBIF
US	Texas	TCWC	85492	34.1206	-100.3647	GBIF
US	Texas	TCWC	90408	32.7511	-099.8073	GBIF
US	Texas	iNaturalist	1462855	27.6813	-099.0413	GBIF
US	Texas	UTEP	H-18944	33.103	-098.6134	GBIF
US	Texas	UBCBBM	H001164	28.0959	-097.4636	GBIF
US	Texas	iNaturalist	429756	29.2291	-098.8748	GBIF
US	Texas	iNaturalist	706734	32.61	-096.9925	GBIF
US	Texas	iNaturalist	714684	29.0083	-098.0453	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	iNaturalist	644963	27.5393	-098.8418	GBIF
US	Texas	iNaturalist	652666	33.4366	-098.7371	GBIF
US	Texas	iNaturalist	758584	28.3237	-096.9166	GBIF
US	Texas	iNaturalist	808684	30.3822	-103.6003	GBIF
US	Texas	iNaturalist	859814	33.9393	-099.4142	GBIF
US	Texas	iNaturalist	1490930	30.2214	-103.3335	GBIF
US	Texas	iNaturalist	1791857	30.2108	-102.9862	GBIF
US	Texas	iNaturalist	1754597	30.208	-103.196	GBIF
US	Texas	iNaturalist	1878569	30.6898	-104.0767	GBIF
US	Texas	iNaturalist	2118478	28.3101	-096.8018	GBIF
US	Texas	iNaturalist	2478965	32.2842	-099.8379	GBIF
US	Texas	iNaturalist	2478848	32.3093	-099.816	GBIF
US	Texas	iNaturalist	247588	31.8913	-098.8398	GBIF
US	Texas	YPM	YPM HERR 002719	30.6	-103.8942	GBIF
US	Texas	iNaturalist	1503375	27.2352	-098.6488	GBIF
US	Texas	iNaturalist	1578799	31.1013	-100.5241	GBIF
US	Texas	iNaturalist	1740720	30.2038	-102.9566	GBIF
US	Texas	iNaturalist	1692448	28.3615	-099.1584	GBIF
US	Texas	iNaturalist	2543492	28.5169	-098.2245	GBIF
US	Texas	iNaturalist	350347	28.6663	-100.2887	GBIF
US	Texas	iNaturalist	776911	28.979	-098.5752	GBIF
US	Texas	iNaturalist	786627	30.1745	-102.7467	GBIF
US	Texas	iNaturalist	1137620	29.8186	-098.8813	GBIF
US	Texas	TCWC	91827	29.9814	-103.2656	GBIF
US	Texas	TCWC	14864	31.5897	-097.6186	GBIF
US	Texas	TCWC	52442	29.374	-098.7751	GBIF
US	Texas	TCWC	63025	31.79	-101.0143	GBIF
US	Texas	TCWC	64012	28.8423	-099.1725	GBIF
US	Texas	TCWC	68359	28.3895	-097.5333	GBIF
US	Texas	TCWC	77183	33.6442	-098.8175	GBIF
US	Texas	UTEP	H-5955	27.5506	-098.0973	GBIF
US	Texas	UTEP	H-19752	30.3426	-103.4802	GBIF
US	Texas	UTEP	H-19805	30.219	-096.8839	GBIF
US	Texas	TCWC	94408	29.6696	-100.0209	GBIF
US	Texas	TCWC	61525	34.5335	-100.9291	GBIF
US	Texas	TCWC	68731	31.5511	-099.8389	GBIF
US	Texas	TCWC	77181	33.5848	-099.2615	GBIF
US	Texas	TCWC	77185	33.768	-098.7975	GBIF
US	Texas	TCWC	79251	27.4537	-098.6711	GBIF
US	Texas	TCWC	79996	28.2022	-098.8483	GBIF
US	Texas	TCWC	82047	29.374	-098.7751	GBIF
US	Texas	TCWC	87095	32.8109	-098.0548	GBIF
US	Texas	TCWC	87096	32.8109	-098.0548	GBIF
US	Texas	MCZ	R-6822	31.4151	-103.5007	GBIF
US	Texas	UTEP	H-124	31.5978	-106.2238	GBIF
US	Texas	UTEP	H-14715	30.9055	-101.8803	GBIF
US	Texas	UTEP	H-15432	30.213	-103.0755	GBIF
US	Texas	iNaturalist	858120	29.8157	-098.7587	GBIF
US	Texas	TCWC	64818	28.7576	-098.3581	GBIF
US	Texas	TCWC	67072	28.855	-098.5397	GBIF
US	Texas	UTEP	H-8988	29.6101	-098.9252	GBIF
US	Texas	UTEP	H-12339	31.4535	-106.0993	GBIF
US	Texas	UTEP	H-18937	33.0556	-099.1784	GBIF
US	Texas	iNaturalist	2543455	26.5964	-097.5575	GBIF
US	Texas	iNaturalist	250562	31.8621	-098.9309	GBIF
US	Texas	iNaturalist	293553	29.6218	-103.0398	GBIF
US	Texas	iNaturalist	301501	27.1379	-098.3742	GBIF
US	Texas	iNaturalist	301475	28.4718	-098.3382	GBIF
US	Texas	iNaturalist	311733	29.2375	-099.7983	GBIF
US	Texas	iNaturalist	741303	32.8032	-101.519	GBIF
US	Texas	iNaturalist	745575	26.4939	-097.5325	GBIF

Continued



Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	iNaturalist	717136	30.2264	-103.6689	GBIF
US	Texas	iNaturalist	1067867	26.285	-097.4257	GBIF
US	Texas	iNaturalist	1432285	27.6447	-098.8395	GBIF
US	Texas	iNaturalist	136359	32.7363	-100.572	GBIF
US	Texas	iNaturalist	1379956	28.1937	-096.992	GBIF
US	Texas	iNaturalist	1477039	29.1134	-098.3701	GBIF
US	Texas	iNaturalist	149101	37.8175	-096.17	GBIF
US	Texas	iNaturalist	1556139	31.1975	-099.4938	GBIF
US	Texas	iNaturalist	1503367	27.7352	-098.8364	GBIF
US	Texas	iNaturalist	1503372	27.465	-098.8376	GBIF
US	Texas	iNaturalist	1561359	27.4459	-098.8368	GBIF
US	Texas	iNaturalist	1610067	30.1978	-102.8995	GBIF
US	Texas	iNaturalist	1630260	30.0157	-104.2101	GBIF
US	Texas	iNaturalist	1728628	30.0953	-097.926	GBIF
US	Texas	TCWC	92297	31.1644	-101.1803	GBIF
US	Texas	TCWC	14272	28.1269	-097.4317	GBIF
US	Texas	TCWC	25976	31.4852	-106.1386	GBIF
US	Texas	TCWC	33623	26.2072	-098.2294	GBIF
US	Texas	TCWC	89850	32.1056	-100.7139	GBIF
US	Texas	iNaturalist	1137548	27.6671	-098.8369	GBIF
US	Texas	TCWC	10559	28.4606	-098.2318	GBIF
US	Texas	TCWC	18314	26.1982	-098.0696	GBIF
US	Texas	UTEP	H-19721	30.7083	-104.1923	GBIF
US	Texas	TCWC	92920	27.4539	-098.9169	GBIF
US	Texas	TCWC	5193	32.2207	-098.2364	GBIF
US	Texas	TCWC	64220	31.7793	-098.1951	GBIF
US	Texas	TCWC	80499	32.7167	-100.9177	GBIF
US	Texas	UBCBBM	H001156	28.0638	-097.5092	GBIF
US	Texas	UBCBBM	H001165	27.5861	-097.9348	GBIF
US	Texas	NCSM	8764	32.3942	-099.3947	GBIF
US	Texas	UTEP	H-18200	31.9364	-104.7188	GBIF
US	Texas	iNaturalist	1620870	30.2346	-103.3697	GBIF
US	Texas	iNaturalist	1591618	30.1954	-102.8929	GBIF
US	Texas	iNaturalist	1391887	28.2416	-098.5625	GBIF
US	Texas	iNaturalist	1837850	30.039	-097.9489	GBIF
US	Texas	iNaturalist	1843096	30.8161	-103.8642	GBIF
US	Texas	iNaturalist	215970	26.5149	-097.4859	GBIF
US	Texas	iNaturalist	2082973	26.348	-098.1828	GBIF
US	Texas	iNaturalist	2506161	25.9305	-097.3662	GBIF
US	Texas	iNaturalist	2645138	29.3854	-099.985	GBIF
US	Texas	iNaturalist	300910	32.6283	-101.3907	GBIF
US	Texas	iNaturalist	758598	28.3056	-096.9433	GBIF
US	Texas	iNaturalist	812348	28.1218	-097.4429	GBIF
US	Texas	iNaturalist	760453	29.7065	-101.2481	GBIF
US	Texas	iNaturalist	1710062	26.8521	-098.8893	GBIF
US	Texas	iNaturalist	1629901	29.8424	-103.212	GBIF
US	Texas	iNaturalist	1629669	30.1193	-103.2534	GBIF
US	Texas	iNaturalist	1747565	29.7767	-099.3863	GBIF
US	Texas	iNaturalist	1265769	30.083	-098.4134	GBIF
US	Texas	TCWC	92938	30.0667	-099.7103	GBIF
US	Texas	TCWC	15035	30.2706	-097.7453	GBIF
US	Texas	TCWC	42862	29.455	-098.6339	GBIF
US	Texas	TCWC	52849	26.1212	-097.9927	GBIF
US	Texas	TCWC	77166	33.6442	-098.8175	GBIF
US	Texas	TCWC	77177	34.1306	-098.1017	GBIF
US	Texas	TCWC	77179	33.8128	-098.1478	GBIF
US	Texas	TCWC	77187	33.4131	-098.8486	GBIF
US	Texas	TCWC	79252	26.7596	-098.842	GBIF
US	Texas	TCWC	84340	33.4785	-098.6688	GBIF
US	Texas	UBCBBM	H001145	28.0959	-097.4636	GBIF
US	Texas	UTEP	H-15853	31.4792	-103.5263	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	UTEP	H-18590	31.6418	-106.3108	GBIF
US	Texas	iNaturalist	793492	28.0503	-099.1878	GBIF
US	Texas	TCWC	92299	28.3885	-096.5657	GBIF
US	Texas	TCWC	61540	34.5335	-100.9291	GBIF
US	Texas	TCWC	65076	32.755	-099.2768	GBIF
US	Texas	TCWC	69356	31.5333	-099.8025	GBIF
US	Texas	TCWC	79241	28.9993	-098.737	GBIF
US	Texas	UTEP	Ho-0916	29.6101	-098.9252	GBIF
US	Texas	TCWC	65987	32.4819	-099.7065	GBIF
US	Texas	TCWC	67468	31.9627	-097.2412	GBIF
US	Texas	TCWC	67519	34.1044	-099.7312	GBIF
US	Texas	TCWC	69503	30.8745	-100.0408	GBIF
US	Texas	TCWC	77175	33.84	-098.2825	GBIF
US	Texas	TCWC	77182	33.757	-099.1499	GBIF
US	Texas	TCWC	77189	34.0683	-098.2781	GBIF
US	Texas	TCWC	79239	29.7936	-098.4211	GBIF
US	Texas	iNaturalist	354023	29.7714	-103.0924	GBIF
US	Texas	UTEP	H-14031	28.3234	-096.8996	GBIF
US	Texas	UTEP	H-15386	30.0169	-098.5168	GBIF
US	Texas	iNaturalist	1884232	28.8859	-099.0563	GBIF
US	Texas	iNaturalist	1414842	30.655	-098.0834	GBIF
US	Texas	iNaturalist	1473671	28.3532	-096.807	GBIF
US	Texas	iNaturalist	1465097	28.3547	-096.8078	GBIF
US	Texas	iNaturalist	1781573	30.29	-103.1463	GBIF
US	Texas	iNaturalist	1751871	27.5735	-097.2356	GBIF
US	Texas	iNaturalist	2474265	28.928	-098.8617	GBIF
US	Texas	iNaturalist	2319801	28.983	-098.524	GBIF
US	Texas	iNaturalist	2354935	26.1263	-097.9566	GBIF
US	Texas	iNaturalist	2633069	26.4138	-098.2472	GBIF
US	Texas	iNaturalist	2644276	32.7401	-097.5112	GBIF
US	Texas	iNaturalist	711646	32.5602	-097.3413	GBIF
US	Texas	iNaturalist	350298	30.4575	-102.4842	GBIF
US	Texas	iNaturalist	268539	32.6588	-097.6817	GBIF
US	Texas	iNaturalist	271219	28.2157	-098.622	GBIF
US	Texas	iNaturalist	1346044	30.1813	-098.4911	GBIF
US	Texas	iNaturalist	1702359	30.357	-101.3426	GBIF
US	Texas	iNaturalist	1621451	29.8082	-101.5607	GBIF
US	Texas	iNaturalist	2558761	34.7862	-100.8991	GBIF
US	Texas	iNaturalist	738037	30.2136	-102.99	GBIF
US	Texas	iNaturalist	906161	26.5257	-098.3832	GBIF
US	Texas	iNaturalist	1462858	28.2035	-098.5721	GBIF
US	Texas	TCWC	94013	32.7358	-100.5716	GBIF
US	Texas	TCWC	33619	26.4752	-098.2967	GBIF
US	Texas	TCWC	42876	29.6094	-098.4686	GBIF
US	Texas	TCWC	52848	26.0917	-098.1801	GBIF
US	Texas	TCWC	67653	31.4663	-098.9182	GBIF
US	Texas	TCWC	77176	33.84	-098.2825	GBIF
US	Texas	TCWC	79255	27.1933	-098.7417	GBIF
US	Texas	UTEP	H-09157	29.5258	-101.0715	GBIF
US	Texas	UTEP	H-17622	31.7614	-106.4186	GBIF
US	Texas	iNaturalist	1717645	29.8052	-098.828	GBIF
US	Texas	TCWC	77173	33.9085	-098.4916	GBIF
US	Texas	TCWC	77188	33.9085	-098.4916	GBIF
US	Texas	UTEP	H-15405	29.7202	-098.1761	GBIF
US	Texas	UTEP	H-18776	28.1098	-097.209	GBIF
US	Texas	UTEP	H-19850	31.9083	-100.9484	GBIF
US	Texas	iNaturalist	1951371	30.7461	-102.9085	GBIF
US	Texas	TCWC	93165	32.1428	-097.3436	GBIF
US	Texas	TCWC	33628	27.0258	-098.2061	GBIF
US	Texas	TCWC	80170	31.5506	-098.4067	GBIF
US	Texas	TCWC	83921	29.6404	-100.4186	GBIF

Continued

Table A1. Continued.

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	UTEP	H-18676	30.7495	-098.1629	GBIF
US	Texas	UTEP	H-18531	28.2375	-098.5633	GBIF
US	Texas	iNaturalist	2356016	26.1264	-097.9567	GBIF
US	Texas	iNaturalist	1974657	29.4305	-098.8632	GBIF
US	Texas	iNaturalist	2397818	28.983	-098.524	GBIF
US	Texas	iNaturalist	247109	27.6613	-098.8372	GBIF
US	Texas	iNaturalist	2612484	26.4087	-098.243	GBIF
US	Texas	iNaturalist	257186	30.1454	-102.3909	GBIF
US	Texas	iNaturalist	2692785	26.4079	-098.2378	GBIF
US	Texas	iNaturalist	312157	27.7594	-098.8359	GBIF
US	Texas	iNaturalist	501677	29.8656	-098.6423	GBIF
US	Texas	iNaturalist	600951	32.651	-098.5788	GBIF
US	Texas	iNaturalist	722435	27.8735	-097.7316	GBIF
US	Texas	iNaturalist	760482	30.1445	-102.4057	GBIF
US	Texas	iNaturalist	806938	30.871	-101.6968	GBIF
US	Texas	iNaturalist	1765795	31.0376	-100.5322	GBIF
US	Texas	iNaturalist	1765709	30.2291	-099.7197	GBIF
US	Texas	iNaturalist	1765805	30.2036	-102.9562	GBIF
US	Texas	iNaturalist	136376	28.5401	-099.4444	GBIF
US	Texas	iNaturalist	1464486	29.9813	-097.6288	GBIF
US	Texas	iNaturalist	1467108	32.413	-097.9601	GBIF
US	Texas	iNaturalist	1541328	26.7259	-098.8463	GBIF
US	Texas	iNaturalist	1528494	27.0775	-098.7945	GBIF
US	Texas	iNaturalist	1591798	33.8891	-099.4022	GBIF
US	Texas	iNaturalist	1594880	28.2708	-096.8258	GBIF
US	Texas	iNaturalist	1617861	30.1996	-102.0482	GBIF
US	Texas	iNaturalist	1702932	30.5318	-101.1618	GBIF
US	Texas	iNaturalist	1601757	31.7614	-106.4178	GBIF
US	Texas	iNaturalist	1620709	30.4684	-102.4158	GBIF
US	Texas	iNaturalist	796058	29.0515	-098.5883	GBIF
US	Texas	iNaturalist	1128697	30.2021	-102.9181	GBIF
US	Texas	TCWC	23468	31.7267	-099.1981	GBIF
US	Texas	TCWC	43779	32.8288	-098.6213	GBIF
US	Texas	TCWC	77169	34.2435	-099.9768	GBIF
US	Texas	TCWC	89390	29.1047	-098.1797	GBIF
US	Texas	TCWC	89772	28.163	-097.0189	GBIF
US	Texas	CAS	10403	34.8663	-100.9686	GBIF
US	Texas	UBCBBM	H001228	28.1071	-097.368	GBIF
US	Texas	UTEP	H-6119	30.9319	-103.7917	GBIF
US	Texas	UTEP	H-16270	35.7352	-100.5746	GBIF
US	Texas	TCWC	94777	31.2864	-102.1318	GBIF
US	Texas	TCWC	91945	30.3181	-103.7711	GBIF
US	Texas	TCWC	92939	29.9486	-100.1733	GBIF
US	Texas	TCWC	94012	32.7358	-100.5716	GBIF
US	Texas	TCWC	5194	32.1286	-098.0935	GBIF
US	Texas	TCWC	48068	31.9274	-097.6491	GBIF
US	Texas	TCWC	67073	31.5378	-099.7094	GBIF
US	Texas	TCWC	79253	27.3479	-098.6161	GBIF
US	Texas	UTEP	H-18414	36.2278	-100.6502	GBIF
US	Texas	CAS	22426	32.6751	-097.4679	GBIF
US	Texas	TCWC	92438	28.4242	-096.5434	GBIF
US	Texas	TCWC	77167	33.7011	-098.8077	GBIF
US	Texas	TCWC	77193	34.0652	-098.6094	GBIF
US	Texas	TCWC	79243	26.0868	-097.9686	GBIF
US	Texas	TCWC	90152	30.1239	-103.5803	GBIF
US	Texas	UBCBBM	H001166	28.1071	-097.368	GBIF
US	Texas	UBCBBM	H001206	28.0959	-097.4636	GBIF
US	Texas	UBCBBM	H001230	27.9325	-097.5822	GBIF
US	Texas	UTEP	H-17668	29.2052	-099.8995	GBIF
US	Texas	iNaturalist	1079099	26.3484	-098.234	GBIF
US	Texas	iNaturalist	1236311	26.4656	-098.2213	GBIF

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**Table A1.** *Continued.*

Country	State	Collection	Catalog Number	Latitude	Longitude	Source
US	Texas	iNaturalist	1339928	28.1691	-098.6775	GBIF
US	Texas	iNaturalist	1243169	27.6403	-097.3919	GBIF
US	Texas	iNaturalist	1391886	28.1434	-098.6169	GBIF
US	Texas	iNaturalist	1494583	30.3478	-097.2934	GBIF
US	Texas	iNaturalist	1464514	29.9988	-097.6063	GBIF
US	Texas	iNaturalist	1472943	27.2439	-098.9349	GBIF
US	Texas	iNaturalist	1589138	28.9459	-098.8606	GBIF
US	Texas	iNaturalist	1599444	33.9205	-098.7592	GBIF
US	Texas	iNaturalist	1605795	30.1439	-102.5965	GBIF
US	Texas	iNaturalist	1652289	31.2271	-099.288	GBIF
US	Texas	iNaturalist	1781583	30.4234	-102.9706	GBIF
US	Texas	iNaturalist	1662353	29.6602	-101.149	GBIF
US	Texas	iNaturalist	1695318	31.8944	-102.3007	GBIF
US	Texas	iNaturalist	1849242	30.213	-103.0627	GBIF
US	Texas	iNaturalist	1903232	26.7594	-098.6133	GBIF
US	Texas	iNaturalist	1945629	26.4948	-098.0166	GBIF
US	Texas	iNaturalist	2371566	30.2081	-098.4493	GBIF
US	Texas	iNaturalist	2481749	26.4454	-098.2414	GBIF
US	Texas	iNaturalist	2474339	26.5146	-098.611	GBIF
US	Texas	iNaturalist	295680	28.4153	-096.6665	GBIF
US	Texas	iNaturalist	711924	29.8596	-101.6991	GBIF
US	Texas	iNaturalist	739401	30.0111	-097.7638	GBIF
US	Texas	iNaturalist	814367	33.8977	-099.4418	GBIF
US	Utah	BYU	18896	38.5733	-109.5492	GBIF
US	Utah	UCM	AC-143	40.5081	-109.1939	GBIF